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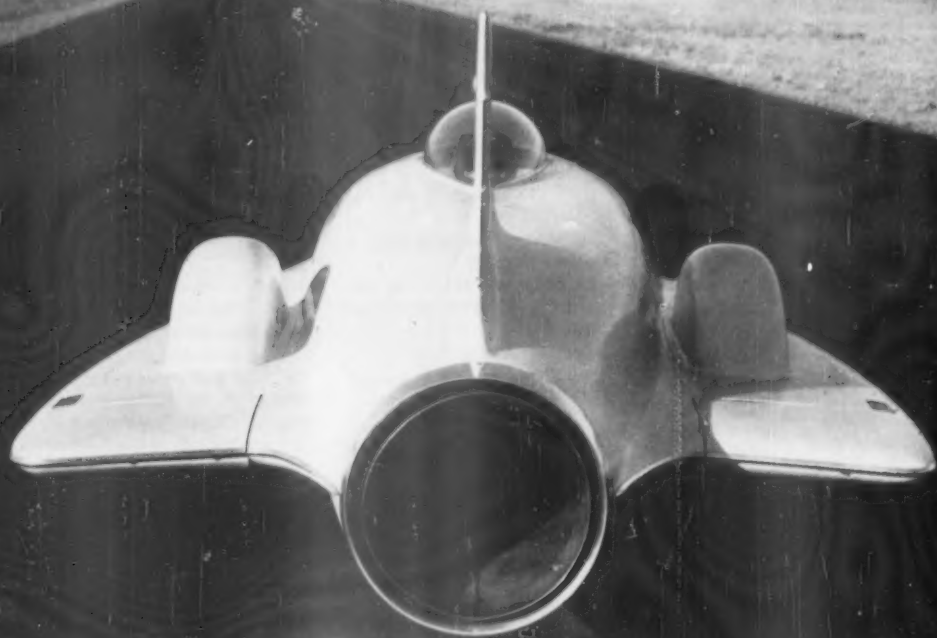
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January 23, 1954

VOL. 55 NO. 4 PAGES 49-64

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Jet Auto

See Page 51

A SCIENCE SERVICE PUBLICATION

Kodak reports to laboratories on:

making pH indicators easier to use...how to find out more about high speed movies...decoupling the sensitivity of infrared film

Indicator solutions

In the more orderly laboratories, it hangs on the wall; in others, you have to rummage for it under somebody's desk blotter. Ubiquitous on the scientific scene it is, though—the famous Eastman pH Indicator



Chart with its array of bars that tell at a glance which of some 50-odd Eastman Organic Chemicals changes from what color to what other color over what pH range. The indicators themselves we have hitherto offered in dry form only—water or alcohol to dissolve them in is plentiful.

Now we have taken a second look at this policy, from the viewpoint of the business manager who knows that such laboratory drudgery as making up indicator solutions is still an expensive proposition. As a result, we report that nearly all the Eastman Indicators are now available as solutions in 500-cc bottles, with solvent, concentration, and pH range stated on the label. We continue to sell the indicators undissolved also.

Direct your inquiries and orders for Eastman pH Indicator Solutions to Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company). Write to the same address if the Eastman Indicator Chart is still not quite ubiquitous enough for your convenience. (It's free.)



High speed booklet

For only \$1713.50 one may purchase from any Kodak Industrial Dealer a Kodak High Speed Camera. This is a 16mm movie camera, probably of no utility on picnics, that makes from 1000 to 3200 pictures

per second. High-quality pictures, too. They can be seen in super-slow motion with an ordinary movie projector at the customary 16 frames per second. There is also obtainable an attachment which photographs the corresponding oscillograph trace right over the pictures, the film advance serving as time co-ordinate.

Some of the best-known typewriters, diesel locomotives, cigarette lighters, oil-drilling bits, breakfast foods, circuit breakers, printing papers, auto tires, beet pickers, casserole dishes, power looms, power tools, addressing machines, shotguns, vacuum cleaners, airplanes, and adding machines are being manufactured today on the basis of information their makers learned or confirmed by buying a Kodak High Speed Camera and submitting their products or processes to its quick and glassy gaze. (On the more academic side, we know of at least one diverted biologist who used the camera to find out how holes in fluids appear and disappear when a missile passes through.)

The subject is mentioned at this time because we have just published a new booklet which explains how the camera works and how it has performed some of its industrial research feats.

For a copy of "High Speed Motion Picture Making in Industry," write Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y.

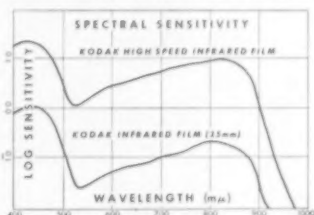
High speed infrared

A close student of the course of photographic technology might surmise that some sort of photographic infrared barrier has been cracked within the past year or so. In a limited sense, he would be right. We have recently learned some new facts about the nature of sensitizing dyes, the substances adsorbed on silver halide crystals to extend their light sensitivity way beyond its natural wavelength limit of about 5000Å. The photographic infrared still ends at about 12,200Å (Kodak

Spectroscopic Plates, Type Z), but the magnitude of the sensitizing effect to that point can now be greatly stepped up.

As one of the new products consequential to this development, we now announce Kodak High Speed Infrared Film. Although it only goes to about 9500Å, its practical sensitivity for such purposes as pigmentation penetration, photography in visual darkness, and heat-distribution studies is about ten times that of Kodak Infrared Film.

We don't try to quote an Exposure Index figure for Kodak High Speed Infrared Film because it depends so much on the proportion of infrared to visible in source emis-



sion and subject reflectivity. Granularity is somewhat higher than that of Kodak Infrared Film. The effect of this on image sharpness tends to be offset in some applications by the fact that the higher sensitivity of Kodak High Speed Infrared Film permits the use of smaller lens openings. This in turn reduces unsharpness due to errors in correcting for the difference between the visual and infrared optical behavior of the lens.

Kodak High Speed Infrared Film is supplied only in 16mm and 35mm perforated form as 100-foot rolls. It requires such extreme caution against fogging that we do not put it up in cartridge form. You can buy it from your Kodak Industrial Dealer. If you want the address of the one nearest you or more detailed information on the film, write Eastman Kodak Company, Industrial Photographic Division, Rochester 4, N. Y.

Price quoted is subject to change without notice.

This is one of a series of reports on the many products and services with which the Eastman Kodak Company and its divisions are... serving laboratories everywhere

Kodak
TRADE MARK

PUBLIC SAFETY

Safety on Highway Trips

Stop-over points, geography of country and sight-seeing visits all affect your chances of survival on highway trips, three scientists suggest to Highway Research Board.

► THE WAY you plan your next big automobile trip may save your life or may get you killed.

Your planned first-day destination, the geography of the country you will be crossing, the sight-seeing points you want to take in, the places you want to eat—all these may play a big role in determining whether you will be involved in an automobile accident.

They were some of the factors reported to the Highway Research Board meeting in Washington by three University of California scientists.

Drs. Heinz Haber, Robert Brenner and Slade Hulbert, all of the University's Institute of Transportation and Traffic Engineering, said they began thinking out these causes when it became apparent that speed, liquor, fatigue, road hypnosis and "altitude-sickness" could not explain many auto crashes on the nation's highways.

Although no experimental data have been obtained to back up the ideas of the scientists, they believe their conclusions are sufficiently accurate to warrant immediate action by state highway departments and automobile clubs.

Accidents seem to have many causes. These causes often result from combinations of ordinary driving conditions, the scientists reported.

If the first day's destination is too far away, the motorist is likely to speed up unwisely. This can happen in particular to commuters who regularly travel a given span of road. These motorists, aware of the time it usually takes them to travel the stretch, sometimes take wild chances to make up time when a delay besets them.

Motoring safety also seems bound up with the driver's sense of touch. When his tactile sense has been dulled by a long drive, the motorist is less likely to respond to skids, the men pointed out. A driver seems to detect a skid with his body before he does with his eyes.

The sense of touch also can affect the driver's safety in traffic. When he has been numbed by long hours at the wheel, he seems to respond to quick stops in traffic much more slowly.

Using a 160-mile strip of U. S. Highway 66 as an accident focal point, the three scientists analyzed some of the possible causes of the 900 major accidents that occurred between the New Mexico-Arizona border and Albuquerque during 1952.

They theorized that some accidents could have resulted when motorists coming from Los Angeles made their first-day destination of Flagstaff ahead of schedule. These motorists may then have decided to drive to

the next logical stopping place, Albuquerque, unaware that fatigue was creeping over them.

The psychological explanation of this is that the motorists' success in reaching their destination ahead of time spurred them to try an even greater accomplishment. The drivers probably underestimated the time and effort necessary for them to make Albuquerque.

Reluctance to change plans when trip situations are altered, or an injudicious change of plans to meet new conditions were cited as other possible causes of highway tragedies.

Setting your goals too high or too low, and performance letdown toward your destination probably affect highway safety.

Road hypnosis, induced by monotonous driving, may cause the driver to see non-existent "emergencies" on the highway. These emergencies usually require drastic action on the part of the driver. This may be partly responsible for accidents.

Hypoxia, the effect of decreased oxygen at high altitudes, also may desensitize the

driver so that he does not respond properly to highway conditions.

The three scientists recommended that motorists planning trips be advised on the psychology of their journeys. Warnings also should be posted near imminent psychological hazards, such as spots where hypnosis is most likely to occur. Continual roadside reminders should be present as the motorist passes through the hazardous areas.

Science News Letter, January 23, 1954

TECHNOLOGY

Develop Experimental Gas Turbine Automobile

See Front Cover

► SUCCESSFUL TESTING of an experimental gas turbine automobile, the XP-21 Firebird, has been announced by General Motors in Detroit.

Constructed to study future possibilities of the gas turbine for commercial uses, the XP-21 has undergone preliminary tests since last October.

The rear view of the Firebird, on the cover of this week's SCIENCE NEWS LETTER, shows its vertical tail fin and swept-back delta wings. On the trailing edges of the wings are brake flaps to supplement the car's wheel braking system. The huge tail-cone is necessary with a gas turbine engine because of the large volume of air it needs to operate.

Science News Letter, January 23, 1954



JUNIOR ANTI-CANCER ACCELERATOR—Six-million-volt electron "bullets" will be fired at cancer from this glass-enclosed "gun" being tested by Donald H. Janney, a graduate student at Stanford University. It is part of a junior-size linear accelerator being made for cancer therapy and industrial inspection.

BACTERIOLOGY

Nation's Bacteria Bank

Department of Agriculture keeps over 1,200 strains of bacteria for present or future use with legume crops. Other bacteria banks also operate around the world.

► THE NATIONAL agricultural bacteria bank at Beltsville, Md., would surprise those who know bacteria only as dreaded disease-causing germs.

There bacteriologists of the U. S. Department of Agriculture have stored more than 1,200 strains of legume bacteria, *Rhizobium*, which are useful or may prove to be useful in the growing of such legume plants as peas, clover, alfalfa and beans.

Dr. L. W. Erdman, senior bacteriologist, points out that in addition to storing and studying our native legume bacteria, the Department imports agricultural bacteria from other nations and exports proved types to help farmers in foreign nations.

Plant explorers each year send new strains from abroad to be added to the store to be tested for possible use on legume crops.

The bacteria form nodules on the roots of legume plants that fix nitrogen from the air. Protein-rich legumes need plenty of nitrogen, an expensive chemical if bought as fertilizer to be added to the soil. Bacteria work for the farmer without pay.

Dr. Erdman said that this is one of the few useful relations between plants and bacteria observed in agriculture. Bacterial diseases take an annual economic toll from the farmer just as such diseases in man are serious menaces to health.

Prior to planting legume seed, many farmers inoculate the seeds with bacteria by mixing them thoroughly with a preparation containing an appropriate bacteria. Some bacteria strains are effective with only one legume and others vary in effectiveness.

Dr. Erdman said the nation's agricultural bacteria bank contains strains from Africa, Europe, Turkey, Japan and South America. The bacteria are kept as long as four years in a nutrient solution covered with sterilized mineral oil.

Elsewhere in Washington some highly unbeneficial bacterial organisms are kept in storage for research by scientists. The Microbiological Institute of the National Institutes of Health keeps disease organisms, known as pathogens, frozen for research.

The American Type Culture Collection, a non-profit private institution sponsored by nine scientific societies, stores many kinds of organisms, both pathogenic and non-pathogenic.

Scientists needing a particular organism for research can obtain it from the American Type Culture Collection. The University of Wisconsin at Madison, Wis., also has an extensive collection of legume bacteria.

Government and university laboratories in Great Britain, Australia and Japan also store useful agricultural bacteria.

Science News Letter, January 23, 1954

AGRICULTURE

Grow Chinese Chestnuts

► CHINESE CHESTNUTS are being grown commercially today in Georgia, Pennsylvania and Maryland orchards, replacing the blight-killed native American chestnut.

Dr. H. L. Crane of the U. S. Department of Agriculture, who has spent many years on chestnut research, has pointed out that these Chinese chestnuts have not replaced the American variety as forest timber trees. They are orchard trees grown for their nuts.

Beginning in 1904, a fungus blight disease struck native chestnut trees with deadly force, practically eliminating the tree from our forests. Plant explorers found that Chinese varieties had a high degree of resistance to the blight.

Certain of these Chinese varieties have outstanding nut characteristics, Dr. Crane said. Larger than American chestnuts, the Chinese nuts compare favorably with European nuts for size and quality. They also have a shell that can be easily removed to leave the kernel free.

One peach and pecan grower in Georgia has planted enough of the Chinese chestnut trees to ship chestnuts by the carload in the near future. His production already amounts to several tons of nuts annually.

Attempts to develop a hybrid tree having the timber characteristics of the American tree, combined with the blight resistance of the Chinese variety, have largely failed so far, Dr. Crane said. Some of the hybrids have survived, but most are only slightly less susceptible to the blight than American trees. The project to produce hybrid chestnut timber trees in America still has a long way to go, he indicated.

At the present time we import about 20,000,000 pounds of chestnuts annually from Europe, mainly Italy. In 1938 the blight struck Italy, and the destruction of all chestnuts in that country is expected soon.

This country is sending pollen, nuts and shoots from Chinese trees here to Italy to help develop blight-resistant varieties there.

Science News Letter, January 23, 1954

• RADIO

Saturday, Jan. 30, 1954, 3:15-3:30 p.m. EST
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.
Dr. Vincent Archer, professor of roentgenology, University of Virginia School of Medicine, will discuss "Radiations Help the Doctor."

Slums cost a city more than they contribute in tax revenue.

Erosion has refilled the great meteor crater in Arizona to less than half of its original depth.

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BLOOD COUNT BY TV—To make a quick count of human blood cells, an electronic "brain" has been joined with a television "eye" by scientists at RCA's David Sarnoff Research Center, Princeton, N. J.

ELECTRONICS

Electronic Blood Counts

► AN ELECTRONIC "brain" has been joined to a television "eye" to yield a mechanical laboratory technician that can beat a human specialist in counting blood cells.

Called the Sanguinometer, the device may detect in record time the number of persons overexposed to atomic radiation in the event of a hydrogen-bomb attack upon this country.

In experiments, it has clicked off this laborious, time-consuming process several times while a human laboratory technician, working without aid from the machine, did only one blood count.

The device uses a television camera to peer into a microscope. The camera flashes what is "sees" on a monitoring video screen. It also sends electronic pulses to the input of an electronic computer. Each pulse indicates that the TV camera's electron beam, sweeping the microscope specimen, has encountered a cell.

The electronic "brain" keeps track of the total number of pulses the camera sends it. Then the computer makes the proper corrections, since the electron beam would ordinarily strike a given cell several times.

In tests, the Sanguinometer has shown only a small margin of error on a count of many varieties of microscopic particles as long as the particles within any one specimen are nearly uniform in size.

Believed to be a useful research tool and laboratory aid, the Sanguinometer was de-

veloped by RCA engineers working with scientists of the Sloan-Kettering Institute, a research unit of the Memorial Center for Cancer and Allied Diseases.

Science News Letter, January 23, 1954

BOTANY

B-Vitamins Concentrated In One Wheat Layer

► THE B-VITAMINS in a grain of wheat are concentrated in one of the grain's outer layers, Drs. J. J. C. Hinton and B. Shaw and F. G. Peers have found in experiments at St. Albans, England.

The aleurone layer, a part of the bran, constitutes less than 7% of the weight of the grain. However, it has 31% of the vitamin B-1, 84% of the nicotinic acid, 39% of the pantothenic acid and 37% of the riboflavin or vitamin B-2.

The scientists first dissected wheat grains into layers, and then tested each layer for B-vitamins. Nicotinic acid and pantothenic acid are commonly called B-complex vitamins.

The B-vitamins and minerals in the aleurone layer do not appear to play a decisive role in the development of the embryo plant, the scientists report in *Nature* (Nov. 28, 1953.)

Science News Letter, January 23, 1954

MEDICINE

Cortisone Speeds Face Paralysis Recovery

► CORTISONE, first famous for relief of crippling, painful arthritis, shows promise of becoming a speedy remedy for Bell's palsy, also known as facial paralysis.

Two children afflicted with this ailment recovered completely in 13 and 17 days, respectively, under cortisone treatment, Drs. W. P. Robison and B. F. Moss of the Medical College of Georgia, Augusta, Ga., report in the *Journal of the American Medical Association* (Jan. 9).

In their experience no patient seen in 15 years has recovered from this paralysis in less than several months. The Augusta doctors point out that results in two cases do not warrant sweeping conclusions, but they call attention to an earlier report of Dr. H. H. Rothendler of New York who treated six Bell's palsy patients successfully with cortisone.

The treatment apparently must be started early in the course of the paralysis, since a seventh patient of Dr. Rothendler's who had had paralysis for 10 days before cortisone was started did not respond to the treatment. Tests before the cortisone was started had showed signs of nerve destruction in this patient.

The cause of Bell's palsy is not known. It is a common disorder that may attack from infancy to old age. Dr. Rothendler reported that he thought cortisone helped by reducing congestion and related local deficiency of blood of the facial nerve and its sheath in the bony canal.

Science News Letter, January 23, 1954

SEISMOLOGY

Earthquake Recorder Can Spot Hurricanes

► HURRICANE PATHS can be spotted with seismographs, the instruments that record earthquakes, Dr. William L. Donn of Columbia University, New York, reports in *Science* (Jan. 8).

Lives of Navy and Air Force pilots on hurricane patrols and thousands of dollars in operational expenses may eventually be saved due to the finding of this shore-based method for charting hurricanes.

Seismographs record not only destructive, earth-jarring quakes, but tiny little fluctuations known as microseisms. Recordings of these microseisms are Dr. Donn's clue to the hurricane's path. This is because the time taken for one fluctuation—from two to six seconds—varies with the depth of the water over which the storm is passing. The depth of the sediment on the ocean floor may also have an effect.

His study of microseism periods in the Gulf of Mexico, the Caribbean Sea and the western North Atlantic Ocean shows "a definite relationship between microseism period and storm position," Dr. Donn declares.

Science News Letter, January 23, 1954

RADIO ASTRONOMY

Radio Astronomy Studies

International gathering of scientists in Washington discusses latest techniques for, and information learned from, studying the heavens by means of radio waves instead of light.

► FOR THE first time, astronomers are getting a picture of the center of the great spinning "pinwheel" of stars that make up the Milky Way galaxy to which the sun and the earth belong.

At an international conference on radio astronomy in Washington, Dr. H. C. van de Hulst of Leiden Observatory, the Netherlands, revealed studies made during the last two months that indicate the structure of our galaxy toward the center. Using radio waves sent out by the very sparse hydrogen gas that fills the space between the stars, he has started to chart the inner parts of the galaxy.

Our Milky Way galaxy is believed to resemble the Andromeda nebula, the only external galaxy easily seen as a hazy patch with the unaided eye, and now visible in the northwestern sky. Because the entire Andromeda galaxy can be seen from the earth, astronomers have a much better idea of its structure than they do of the Milky Way's form.

The sun is located in one of the arms of our galaxy, and being thus off to one side makes seeing the structure of our galaxy with light waves extremely difficult.

However, using the new technique of radio astronomy, scientists were first able to detect the Milky Way's spiral arms, and now they are finding its form toward the center.

Nearly ten years ago Dr. van de Hulst predicted that neutral hydrogen in interstellar space ought to emit energy of 21 centimeters wavelength, which could be picked up with delicate radio equipment. By charting the pattern of distribution of the hydrogen gas between the stars, he and his co-workers at Leiden Observatory hope to get a clearer picture of how our Milky Way is put together.

The sun, he has found, is 8.2 kiloparsecs from the center of the galaxy, or about 160,000,000,000,000 miles. In a direction slightly away from center, his studies have shown two wrappings around the center, one at about two kiloparsecs and one at about 13 kiloparsecs.

Science News Letter, January 23, 1954

RADIO ASTRONOMY

Sun Throws Out Particles At One-Fifth Light Speed

► OUR SUN is throwing off particles at speeds up to one-fifth that of light, or 37,000 miles a second. The first direct evidence that the sun can eject cosmic-ray type particles at the time of major flare-ups was found by Paul Wild of the radiophysics

division of the Commonwealth Scientific and Industrial Research Organization in Sydney, Australia.

Cosmic rays are highly energetic particles continuously bombarding the earth from space. Where they come from and how they get their tremendous energies are still mysteries, but Mr. Wild's work has resulted in the most definite clue so far.

"If a quiet, innocuous star like the sun can speed up particles to one-fifth or one-tenth the velocity of light all of a sudden, what can the monster star do? Very active stars would be throwing off such particles all the time," Dr. E. G. Bowen, director of the radiophysics division, said in Washington in explaining Mr. Wild's work.

Most methods so far suggested to account for the high speeds of cosmic rays require that the particles have an "injection" velocity about one-tenth that of light. Since Mr. Wild reports he has actually measured particles ejected from the sun at even higher velocities, the problem of the origin and very high energies of cosmic rays may have been solved.

To make his observations, Mr. Wild used new equipment put into operation in the past two months. Instead of light, he uses radio waves to search the sun and its surrounding area. With the improved equipment, he found "noise" — which sounds somewhat like static on an ordinary radio — caused by particles thrown off by the sun. By tracing the path of these noise-producing particles, Mr. Wild fixes their outward speeding from the sun at up to 37,000 miles a second.

His new set-up searches for radio waves at frequencies of from 40 to 240 megacycles per second ten times during each second.

Science News Letter, January 23, 1954

RADIO ASTRONOMY

Search for Radio Waves Of H-Bomb Element

► A SEARCH for the H-bomb element deuterium in the vast spaces between the stars will be made this spring, Dr. H. I. Ewen of Harvard College Observatory revealed at the conference.

Although the expected amount of deuterium in interstellar space is extremely minute and could have no practical value on earth, Dr. Ewen believes that hydrogen's heavy twin will signal its presence by radio waves. The equipment he is now building should be sensitive enough to pick up the 327 megacycle deuterium radiation from the sky.

Dr. Ewen also described an improvement

in equipment now being used to observe the radio waves from hydrogen in interstellar space with Harvard's radio telescope. With it, Dr. Ewen has been able to speed up the radio wave observations so that in two months, work scheduled to take one year has been completed.

Using the new equipment, Edward Lilly and David Heeshan have been able in 15 minutes to make tracings of the distribution of interstellar hydrogen that previously took six hours.

Science News Letter, January 23, 1954

RADIO ASTRONOMY

Confirm Positions of Hissing Radio "Stars"

► POSITIONS ON about a dozen of the radio "stars" hissing at us from the heavens have been confirmed since New Year's Day with the new radio telescope at Ohio State University, Dr. J. D. Kraus reported.

The instrument, twice as large as its predecessor, has 96 antennae, each in the form of a helix, or spiral. It was first put in operation on the evening of Jan. 1. Before the year is out, Dr. Kraus predicted, the new instrument will have spotted several as yet undiscovered sources of radio radiation in the sky.

Science News Letter, January 23, 1954

RADIO ASTRONOMY

Electrons May Cause Radio Waves from Space

► ELECTRONS MAY cause some of the radio waves received on earth as hisses from the heavens, Dr. Fred Hoyle of Cambridge University, England, told the conference on radio astronomy.

"The discovery that strong radio emission regions seem always to be connected with places where there are very high internal motions" of the great gas clouds sometimes seen as stars led him to this conclusion, Dr. Hoyle said.

In trying to explain the cause of the radio waves picked up by giant metal "dishes" aimed at the sky, astronomers had previously dismissed the electron, believing it could not play a major part. The electron is the smallest known particle having a negative charge.

However, using new facts learned within the last year about radio sources, Dr. Hoyle has now concluded that electrons could cause sufficient radiation if there was a strong magnetic field and if the nebulous matter was in turbulent motion.

Investigation of invisible radiations in the radio range coming from the sky is an especially promising new method of attacking astronomical problems.

About 50 astronomers and radio engineers from all over the world attended the three-day conference, sponsored by the National Science Foundation, the Carnegie Institution of Washington and the California Institute of Technology.

Science News Letter, January 23, 1954

METEOROLOGY

Meteor Dust "Makes" Rain

Study of rainfall patterns show that, 29 or 30 days after the earth enters a large meteor stream, the amount of rainfall, if any, is at a peak. Meteoritic dust is believed the cause.

► METEORITIC DUST sifting down from the heavens may do more to "make" rain than all the particles human rain makers throw into clouds as "seed."

This is shown by research of Dr. E. G. Bowen, director of the radiophysics laboratory of the Commonwealth Scientific and Industrial Research Organization, Sydney, Australia, discussed in a *SCIENCE SERVICE* interview.

Dr. Bowen's studies show that, 29 or 30 days after the earth enters a major meteor stream, if rain falls at all, the chances are extremely good that the rainfall will be a heavy one. He pointed out that the chances of rain occurring on a certain day are not due to meteoritic dust, but are determined by local and world-wide weather patterns.

However, if, about a month after a big meteoritic shower, these weather patterns are such that rain does fall, then the amount of rain will be considerably increased because of the atmosphere's meteoritic dust.

His new findings are expected to influence artificial rain-making now a most controversial weather subject. Western ranchers and farmers spend hundreds of thousands of dollars a year on efforts to make it rain, yet the Weather Bureau, backed by nearly a 100 years of records, often can

tell them it would have rained without the rain maker's efforts.

President Eisenhower recently appointed a Committee on Weather Control and Evaluation, headed by retired Navy Capt. Howard T. Orville of the Pendix Aviation Corp., Baltimore, to check on the success or failure of cloud seeding experiments and to recommend weather control laws. (See *SCIENCE NEWS LETTER*, Dec. 24, p. 406.)

Dr. Bowen hit upon the meteoritic dust effect when he discovered that heavy rainfalls occurred on certain days rather than others, and that this pattern was repeated "year after year." Later, he found, the heavy rainfall peaks occurred on nearly the same days in both the northern and southern hemispheres.

The reasons for this world-wide, repeating pattern, Dr. Bowen concluded, would most likely be from outside the earth. That meteor showers were the answer was clinched when he discovered that the times of rainfall peaks varied by one day prior to 1900. Because of the way our calendar is set up, days of peak rainfall observed prior to 1900, by actual date, would come one day earlier than those found during this century.

Dr. Bowen's conclusion is that "meteoritic dust exists in adequate quantities to affect

the rainfall of the lower atmosphere, and its time of fall is of the right order to account for the observed interval between meteor showers and peaks of rainfall."

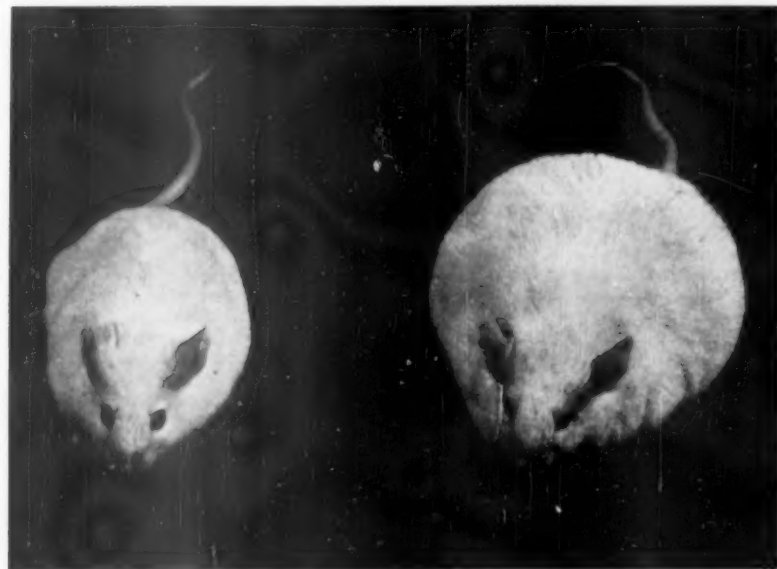
Other scientists have found that the total mass of material falling on the earth in sizes large enough to give visible meteors is about a ton a day. This visible material is accompanied by dust, and the amount of these dust particles swept up by the earth in its path through space is thought to be about 10,000 tons a day, on the average.

It is this dust accompanying meteor showers that, when it falls into cloud systems in the lower atmosphere, provides the rain-forming nuclei, Dr. Bowen believes. When the particles are in interplanetary space, they are believed to have speeds of six to eight miles an hour in relation to the earth.

However, on entering the earth's atmosphere, those particles less than two ten-thousandths of an inch in diameter are stopped sharply at a height of about 60 miles. It would take particles of this size from 30 to 50 days, Dr. Bowen has calculated, to drift from 60 miles to 40,000 or 50,000 feet, the height where towering clouds are found.

Among other effects that sudden stopping of the meteoritic dust might produce on our atmosphere, Dr. Bowen states, are the noctilucent, or night-shining, clouds high in our atmosphere. Nearly 20 years ago, Dr. E. H. Vestine of the Carnegie Institution of Washington, charted the dates of the appearance of these noctilucent clouds, and some of them coincided then with the then known meteor streams. New daytime meteor showers, discovered by use of radar 15 or more years later, also correspond to the dates on which Dr. Vestine found night-shining clouds appeared.

Science News Letter, January 23, 1954



GOLD-FATTENED MICE—Gold injections, part of a cancer research program, caused the laboratory mouse at right to grow three times fatter than the normal-weight mouse at left.

MEDICINE

Gold Fattens Mice, Makes Them Cancerous

► DISCOVERY THAT mice fattened by injections of gold are at least twice as likely to get cancer as normal mice is announced by Dr. Samuel H. Waxler and Pelagia Tabar of Stanford University, Calif.

Apparently it is the fat and not the gold chemical that caused the increase in rate of cancer development, since a few mice did not get fat in spite of the treatment and, among these, the frequency of cancer also dropped.

The injections of gold thioglucose, Dr. Waxler had found previously, gives the mice a ravenous appetite and causes them to develop thick layers of fat. They gain two to three times their normal weight.

Among gold-fattened mice, 64% of the males between the ages of one year and 16 months developed cancer of the liver, compared to 28% of control mice. These were all from a cancer susceptible strain in which about 25% unfailingly develop cancer.

Among female gold-fattened mice, 50% developed breast cancer by the age of 295 days, compared to 19% of the controls.

Science News Letter, January 23, 1954

ENDOCRINOLOGY

Glands Stimulated by Amino Acids of Food

► **DISCOVERY** THAT some of the body's glands, such as those that produce anti-arthritis cortisone and ACTH, may be stimulated by the amino acids that build high quality protein food is announced by Drs. Ilmari Vartiainen and Juhani Apalahti of the University of Helsinki, Finland.

Diets that do not come up to the best in quality of such foods could, therefore, lead to diseases of the endocrine glands and of body metabolic processes the doctors point out.

Their findings were made in tests of the number of white blood cells of the kind called eosinophils following feedings of proteins, such as gelatin and the milk-cheese protein, casein, and of tyrosine, one of the essential amino acids found in casein but not in gelatin.

When healthy volunteers swallowed test meals of casein and tyrosine, the number of eosinophils circulating in their blood dropped. The effect was much weaker when the test meal consisted of gelatin.

American scientists have already shown that the number of eosinophils in the blood is decreased by ACTH from the pituitary gland. Presumably this is because ACTH increases the production of adrenal gland hormones such as anti-arthritis cortisone.

Epinephrine, or adrenalin, another adrenal gland hormone, causes a similar decrease in eosinophil cells. The theory is that epinephrine produces this effect by a circuitous path through which it stimulates the pituitary to produce more ACTH.

A German scientist had suggested that proteins in foods might produce changes similar to those caused by epinephrine and that proteins could be considered as stimulants of the sympathetic nervous system. The Finnish doctors decided to test this theory, with the results reported in the *Journal of Clinical Endocrinology and Metabolism* (Dec., 1953).

Science News Letter, January 23, 1954

PUBLIC HEALTH

VA Mass Survey for TB Pays Health Dividends

► **HEALTH DIVIDENDS** to the entire nation, now and in the future, are expected from the mass screening tests for tuberculosis conducted by the Veterans Administration over the past four years.

The screening tests consist of chest X-rays taken of every veteran on admission to a VA hospital, of every patient examined at VA outpatient clinics at regional offices unless X-rayed within the previous six months, and of all VA employees. If the hospital patients stay in the hospital for a long period, they are X-rayed every 12 months or oftener if necessary. The employees are X-rayed at the time of employment or sep-

aration or transfer, and again at six- to 12-month intervals or oftener if necessary.

So far, 2,513,000 patients and 704,000 employees have gone through the screening. Among these, 12,740 cases of active tuberculosis of the lungs and 34,470 cases of inactive lung tuberculosis and nearly 91,000 other chest conditions have been discovered. These other conditions included cancers and heart diseases requiring immediate attention.

Advantages cited in the official report are:

The segment of the population covered is so large that the results not only will reduce the incidence of TB infection among veterans and their families, but also should reduce the number of TB cases and deaths among the general population.

The mass survey has made it possible, for the first time, to keep VA installations virtually "clean" from TB infection of others.

Of incalculable value to the economic and physical health of the nation is the fact that the search is turning up so many cases in the early, or minimal, stages of TB, at which time proper treatment has a greater chance of effecting a speedy and lasting cure.

Science News Letter, January 23, 1954

PSYCHOLOGY

"Fixation" Studied to Improve Traffic Vision

► **IF PSYCHOLOGISTS** can find out more about a phenomenon known as "fixation," the knowledge may reduce traffic accidents and produce better aircraft gunners.

This phenomenon is being investigated by Dr. Irving Maltzman, Dr. Eugene Eisman and William Smith, University of California at Los Angeles psychologists, under an Army Ordnance grant.

They are seeking the answers to such questions as:

Why do a driver's eyes become so fixed upon a straight stretch of lonely road that he doesn't see a car entering from a side road?

What makes an aircraft gunner stick with a target out of range even after another target appears at close range?

The experimental set-up involves tracking a target with a beam of light and measuring the time it takes subjects to change over to a new target suddenly presented. It also involves certain types of written problems which indicate the degree of fixation in subjects.

Preliminary results suggest that the emotional make-up of the individual may be in part responsible for the fixation.

Dr. Maltzman thinks that the study may aid in setting up a training program designed to overcome the problem. This would be particularly suited for gunnery training in the armed forces.

At present college students are being used as experimental subjects. Military personnel will be tested at a later date according to present plans.

Science News Letter, January 23, 1954

IN SCIENCE

ACOUSTICS

Sound Absorber May Take Throb Out of Planes

► **AN ELECTRONIC** sound absorber has been devised that may take the low throb out of airplane engines.

The device consists of a microphone, amplifier and loudspeaker. It could be attached near the head rest on airplane seats to reduce to a whisper the low beat of the engines near the passenger's ears.

Similarly, the device could be used in automobiles and factories to cut down noise that annoys persons. Several of the absorbers placed on noisy machines also can help cut down the racket the machinery "broadcasts" to persons working nearby.

Harry F. Olson and Everett G. May, both of the RCA Laboratories, Princeton, N. J., report in the *Journal of the Acoustical Society of America* (Nov., 1953) that the electronic absorber is much better in the low-frequency-sound range than ordinary sound-absorbing materials. These materials do not absorb much low-frequency sound.

The electronic sound absorber is designed to cancel out sound by picking it up on the microphone, amplifying it and then feeding it back toward the microphone through the loudspeaker. Sound coming from the loudspeaker is out of phase with sound hitting the microphone.

This tends to cancel out the sound near the microphone. Thus if a person's ears were in the general vicinity of the microphone, the airplane, machinery or factory would seem less noisy at that spot.

The research scientists reported that the device reduces sound 10 to 25 decibels over a three-octave low-frequency range.

Science News Letter, January 23, 1954

ENTOMOLOGY

Insecticide in Tree Kills Attacking Pest

► **A NEW** way of fighting an insect parasite on Africa's most valuable timber tree has been developed, Dr. John Nicol, West African Cacao Research Institute, Tafo, Gold Coast, has reported in *Nature* (Jan. 2).

The insecticide Hanane is applied to the soil where it is absorbed by the tree roots and carried throughout the tree's circulatory system. When the insect, *Phytolyma lata*, attacks, the insecticide in the tree kills it.

The insect, a psyllid, attaches itself to new shoots on young trees, causing heavy galls or swellings that stunt the growth of the tree. The timber tree is *Chlorophora excelsa* and is found in many sections of tropical Africa.

Science News Letter, January 23, 1954

ICE FIELDS

OPTICS

Vision Reduced Some By Tinted Windshields

► VISION IS cut down slightly at night by tinted windshields for most persons, but a few motorists are able to see a bit better.

James A. Stone and A. R. Laur, both of the Iowa State College driving research laboratory, told the Highway Research Board meeting in Washington that their experiments definitely show that tinted windshields do not improve night visibility, except for a few persons.

The scientists asked 60 subjects to peer into a darkened tunnel-like device in tests. A moving belt inside, illuminated as if by automobile headlights, simulated the road. Targets placed on the belt could be made to swoosh toward the subjects at speeds up to a proportional 60 miles an hour.

Tests showed that blue-tinted glass did not markedly obscure bluish objects, as was expected. Nor did blue-tinted glass make yellow objects easier to see, as was supposed.

However, it was determined that any sort of filter that narrows or reduces the band of visible light transmitted through the windshield to the driver will cut down seeing efficiency.

Science News Letter, January 23, 1954

GENERAL SCIENCE

Russia's Polar Stations Outnumber U. S. 60 to 1

► RUSSIA'S POLAR observation stations outnumber those of the U. S. 60 to one, Dr. Norman J. Wilimovsky of the Natural History Museum at Stanford University reported to the Western Society of Naturalists meeting at the University of Southern California.

To study ice and weather conditions in the Arctic, the Soviet Union has a chain of bases across its far northern boundary from the Atlantic to the Pacific, Dr. Wilimovsky stated. The lone U. S. Arctic Research Laboratory is at Point Barrow, Alaska.

"The Russians try to predict from their observation posts when the Arctic ice will break up and when their northern sea route will open," Dr. Wilimovsky said.

"This has been done by sampling plankton, the tiny plants and animals in the sea. The amount and kinds of such food in the ocean indicate how many days or months have passed since the ice broke at distant places and drifted toward the observation stations. Predictions can be made on future breaks.

"Our Air Force radar observations on polar flights can detect openings in the ice

pack, but cannot show how long the ice has been broken."

The ocean under the polar ice pack teems with life, Dr. Wilimovsky said. Seals and fish feed on minute organisms in the ocean, and birds eat the fish. Bears feed only upon seals. All the animals and birds feed on each other in a relentless life cycle originating in the sea.

The longer ice stays in the Arctic ocean, the more fauna it picks up, just as a log floating in sea water becomes increasingly covered with barnacles and microscopic organisms, he said.

Science News Letter, January 23, 1954

AGRICULTURE

Asphalt Spray Holds Soil Until Grass Grows

► ASPHALT SOON may be widely used to hold down loose soil on freshly graded lawns and newly-plowed fields until grasses or crops become established to prevent erosion.

The material, commonly used in road surfacing, was tried on a newly built waterway at a University of Wisconsin farm early in the fall of 1953.

The 1,200-foot, six percent slope waterway was seeded with oats, alfalfa-brome mixture and annual rye grass, and was then sprayed with a light coat of water emulsion type asphalt heated to 125 degrees. It formed a thin, open honeycomb layer over the loose soil.

A heavy rain that fell shortly after the waterway was finished ordinarily would have caused severe damage to the waterway by washing away the loose soil, making re-grading and re-seeding necessary. However, the protective cover of hardened asphalt kept the soil in place and the seeding came up in good condition.

Farm manager V. W. Matthais reported that after several months of growth, the seeding was in good condition still and had shown no bad effects from the asphalt.

Science News Letter, January 23, 1954

TECHNOLOGY

Compressed-Air Saw for Hazardous Locations

► POWER SAWS that run on compressed air have been created by German engineers. They are designed to work in places threatened with fire hazards.

The compressed-air chain-tooth saw, made by a company in Wuertemberg, thus can be used in areas forbidden to saws driven by gasoline engines or electric motors—areas where a backfire or spark might trigger a major explosion.

Pneumatic saws in two varieties have been produced so far by the company. The first is a one-man cross-cut saw that makes cuts up to 23.6 inches long. The other is a one-man bowsaw that handles wood up to 13.8 inches thick. Respectively, the saws weigh 33 and 44 pounds.

Science News Letter, January 23, 1954

FORESTRY

Forest Service Reports 1,027 Different Trees

► THE GOVERNMENT has just completed an extensive tree hunt. There are 1,027 different species of trees known to grow in the United States and Alaska. The U. S. Forest Service spent nine years preparing the listing.

Trees, as far as the Forest Service is concerned, are woody plants with a single erect stem or trunk, three inches or more in diameter at four and a half feet above ground and at least 12 feet high.

Dr. Elbert L. Little Jr. of the Forest Service prepared the 450-page check list, "Native and Naturalized Trees of the United States Including Alaska." The new listing replaces a list made in 1927.

Science News Letter, January 23, 1954

PUBLIC HEALTH

Prevent Sickness to Reduce Medical Costs

► GREATER EFFORTS to prevent sickness may be one means the Eisenhower administration will push for solving the controversial problem of government versus private health insurance to meet the costs of medical care.

In a speech at the New York Academy of Medicine, Dr. Chester Scott Keefer, special assistant to the Secretary of Health, Education and Welfare said:

"Many of a family's most severe and prolonged costs of medical care can be forestalled by greater emphasis on prevention and by continuing health counseling on the part of the family physician."

He pointed to mass screening for signs of one or more chronic sicknesses as a "significant development" in preventive medicine and health education. Often through these screening tests, he pointed out, diseases such as diabetes or high blood pressure, or both, can be detected early enough for medical attention to keep the diseases under control. Presumably he also meant to imply that early treatment would help keep the diseases from developing to a stage that threatens life or requires costly medical care, or both.

Expansion and improvement of private voluntary health insurance, he said, will "go a long way toward reducing the future problems of meeting the costs of medical care for all groups in the population."

Dr. Keefer said he agreed with an Academy of Medicine statement that efforts to cure the world of its ills by "massive" doses of social legislation were fraught with great danger.

He pointed to the need for teamwork between private practice of medicine and public health, and stressed again the need for preventive medicine through five steps, from health education to rehabilitation, to "forestall complete disability and dependence and to help the patient make the maximum use of his remaining capacities."

Science News Letter, January 23, 1954

ASTRONOMY

Jupiter Most Prominent

The giant planet Jupiter dominates the February sky until well past midnight. Among the constellations, some of the less well known winter groups are described.

By JAMES STOKLEY

► THE PLANET Jupiter, still the brightest star or planet in the evening sky, is now in its most prominent position. As the sun sets, it is already well up in the east, and it does not disappear behind the western horizon until about three in the morning.

The accompanying maps, which depict the sky as it appears about 10:00 p.m., your own kind of standard time, at the first of February and about nine o'clock at the middle of the month, show its position in the constellation of Gemini, the twins. Its great brilliance makes it easy to find, however, and it provides a good starting point from which to locate the neighboring constellations.

Close by Jupiter, above and to the left, are Castor and Pollux, the brightest stars in the constellation of the twins. Pollux, of the first astronomical magnitude, is the brighter and lower. Directly below Jupiter is Canis Minor, the lesser dog, with the star Procyon.

Still farther down, and a little to the right, we find the great dog, Canis Major, with Sirius, often called the dog-star. This is the brightest star seen in the nighttime sky, although Jupiter, which is a planet, exceeds it by about 45%.

Orion Is Familiar

Above and to the right of the great dog is one of the best-known of all star groups, easily identified by the three stars in a row, which are nearly in line with Sirius. These form the belt of the warrior, Orion, which is the name of this figure.

In it are two first-magnitude stars: Betelgeuse, which is above and to the left, and Rigel, below and to the right. Betelgeuse, with a slightly fainter star, Bellatrix, to the right, form the giant's shoulders, as depicted on the old star maps showing the mythical figures drawn around the stars.

Orion was represented as holding an upraised club, in protection from the charging bull, the constellation of Taurus, which is still higher and farther right. Ruddy Aldebaran marks the eye of the bull. It is in a V-shaped group of stars that outline the face of the animal.

Above Taurus, right at the zenith, in fact, for the times of our maps, is Auriga, the charioteer, in which is found still another star of the first magnitude, Capella.

Coming up into the eastern sky is the figure of Leo, the lion, a herald of the approaching spring, since it may be seen high in the south on April and May eve-

nings. Regulus, another star of the first magnitude, is located here, at the end of the handle of the sickle, six stars outlining the shape of that agricultural implement.

Jupiter is not the only planet visible on February evenings, but the others will be more difficult to locate. One is Mercury, which will be farthest east of the sun on Feb. 13. Thus, a few days before and after this date, it will remain visible in the gathering dusk for a little while after the sun has gone down.

However, one must look for it right after sunset, low in the southwest, while there is still some twilight. By the time the sky is completely dark, Mercury will have set.

Other Planets Visible

About midnight the planet Saturn appears above the eastern horizon, in Libra, the scales. It is followed two hours later by Mars, in Scorpius, the scorpion. Venus is not visible easily in February, since it is far out beyond the sun and nearly in line with that body.

The constellations of Orion, Taurus, the great and lesser dogs, and the twins are all so brilliant that they easily dominate the winter evening skies, and one is apt to forget the other groups that are now visible. Even though they contain no stars of the first magnitude, they can easily be located with the aid of our maps.

Three of these are right around Orion himself. Just to the left, between the two dogs, is Monoceros, the unicorn, a group whose origin is unknown, although allusions to it have been found as early as 1564.

Right below Orion, under his feet, in fact, is the little group of Lepus, the hare, sometimes said to have been placed there because it was one of the animals that Orion took

pleasure in hunting. Some legends connect it with the moon.

The markings on that body are most familiarly recognized as the face of the "man in the moon," but a little imagination shows other figures there and one is the head of a hare, or rabbit, with his two long ears.

To the west of Orion we find Eridanus, the river. This goes back to early times, for it was mentioned in the famous astronomical poem, the "Phenomena," by Aratus, Greek poet of the third century B.C. According to one Greek astronomer, Eratosthenes, it represented the Nile. Later the Romans identified it with the River Padus, the modern Po, which flows through Italy.

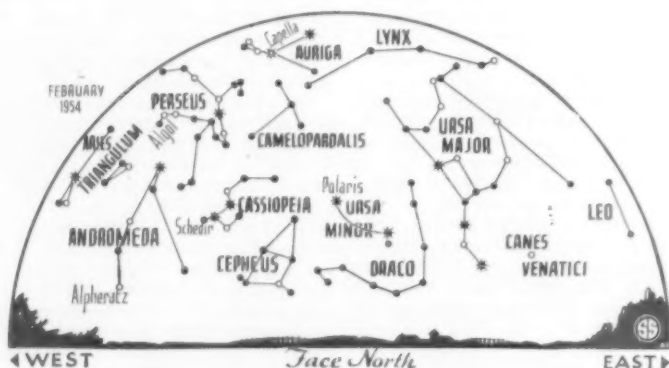
Constellation of the Zodiac

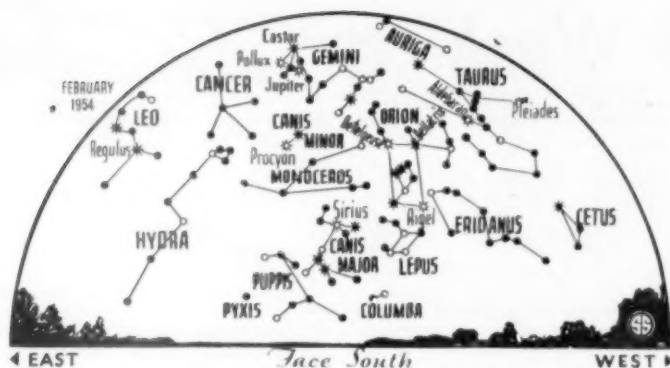
Between Gemini and Leo is Cancer, the crab, which can hardly be called a little-known constellation, since it is one of the 12 making up the zodiac, the path of the sun, moon and planets through the sky. It is most inconspicuous of them all, however.

Among the Egyptians it was not a crab, but a scarab, their sacred beetle that was emblematic of immortality. Just above and to the right of the central star in Cancer, as shown on the map, is a famous naked-eye star cluster, Praesepe, also known as the Beehive, which presents a dim misty appearance on a dark clear night.

A pair of opera glasses, or binoculars, will show it more clearly. Another name for it is the "Manger." Two asses, represented by nearby stars, are supposed to be feeding from it!

Below Cancer is the head of Hydra, the water-snake, the rest of his long body continuing to the southern horizon. This also is mentioned by Aratus, but probably goes back many centuries earlier. On a stone, bearing representations of star groups, found in the Euphrates and dating from 1200 B.C., there is a snake that is supposed to represent Hydra. It was one of the





☉ * ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

symbols used by the Babylonians for their great dragon, Tiamat.

Under Lepus is the little constellation of Columba, the dove, which first appeared in the 17th century, and was intended to represent the dove that Noah sent out from the Ark. Farther to the left, under Canis Major, is Puppis, not conspicuous to us, but actually part of the largest of all the constellations, and one of the most prominent.

The most brilliant parts, unfortunately, are not visible from most of the United States; one has to go farther south to see it. This is Argo, the ship, which is so big that it is subdivided into four constellations, of which the most northern is Puppis, the stern, shown on the map. The star alongside it is part of Pyxis, the compass, another section of Argo.

Still farther south, and now prominent to people in the southern hemisphere, are Carina, the keel, and Vela, the sail. In Carina is the brilliant star Canopus, second in brightness only to Sirius of all the stars seen in the nighttime sky.

Celestial Time Table for February

Feb.	EST	
3	10:55 a.m.	New moon.
6	1:00 a.m.	Moon nearest—distance 226,600 miles.
10	3:29 a.m.	Moon in first quarter.
12	12:24 a.m.	Moon passes Jupiter.
	2:25 a.m.	Algol (variable star in Perseus) at minimum.
	6:00 p.m.	Pluto nearest—distance 3,187,000,000 miles.

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By P. J. CANN

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- 13 3:00 p.m. Mercury farthest east of sun—visible for a few days around this time low in west just after sunset.
- 14 11:14 p.m. Algol at minimum.
- 17 2:17 p.m. Full moon.
- 8:04 p.m. Algol at minimum.
- 20 4:53 p.m. Algol at minimum.
- 22 2:00 a.m. Moon farthest—distance 251,900 miles.
- 23 4:33 p.m. Moon passes Saturn.
- 25 11:53 p.m. Moon passes Mars.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, January 23, 1954

ELECTRONICS

Language Translation By Electronic "Brain"

► DEVICES THAT can "read" a printed page automatically will be needed before translations from one language to another by electronic "brains" will be of any practical value, many computer specialists believe.

Although scientists now know how to instruct giant "brains" so that the translations they do make sensible reading about 85% of the time, many of them believe it will be a long time before the machine replaces a human translator. Two reasons for this are that many words have two or more meanings and that there are wide variations in grammatical structure of sentences from one language to another.

In a public demonstration at the International Business Machines world headquarters in New York, Russian was translated into English by an electronic "brain." Dr. Leon Dostert of Georgetown University, Washington, cooperated with IBM mathematicians in preparing the instructions required by the machine to do its translating.

About two years ago, Dr. Harry Huskey and two colleagues at the University of California at Los Angeles worked out the instructions necessary to translate German to English, using SWAC, the National Bureau of Standards' Western Automatic Computer. The same methods they used could, however, be applied to translation of other languages, including Russian.

Science News Letter, January 23, 1954

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

CAUSES OF INDUSTRIAL PEACE UNDER COLLECTIVE BARGAINING: Fundamentals of Labor Peace, A Final Report—Clinton S. Golden, Committee Chairman — National Planning Association, Case Study No. 14, 119 p., paper, \$1.00.

CHEMISTRY FOR OUR TIMES — Elbert C. Weaver and Laurence S. Foster—McGraw-Hill, 2nd ed., 666 p., illus., \$4.12. Acquainting young people with many of the practical applications of the science.

FILLING AND SEALING OF JOINTS AND CRACKS IN CONCRETE PAVEMENTS — Highway Research Board, Bulletin 78, 38 p., illus., paper, 60 cents.

FISHES OF THE MARSHALL AND MARIANAS ISLANDS: Families from Asymmetronidae through Sigamidae — Leonard P. Schultz and others — Gov't Printing Office, U. S. National Museum Bulletin 202, 685 p., illus., paper, \$2.75. Describing fishes collected in connection with and after the atom bomb tests of Operation Crossroads.

HIGHWAY RESEARCH ORGANIZATIONS: Description of Existing Organizational Patterns and Scope of Activities—M. Earl Campbell—Highway Research Board, Special Report 15, 44 p., paper, 75 cents.

HOPE AND HELP IN PARKINSON'S DISEASE — John C. Button, Jr.—Vantage Press, 198 p., \$4.95. Modern research offers a spark of hope for the many victims of this ancient disease, called in the Bible "shaking palsy."

MAJOR USES OF LAND IN THE UNITED STATES — H. H. Wooten—Gov't Printing Office, USDA Technical Bulletin 1082, 190 p., illus., paper, 30 cents. Supplying an account of the extent and distribution of major agricultural land uses and an estimate of future needs.

MATERIALS SURVEY—BAUXITE—National Security Resources Board—Gov't Printing Office, 304 p., illus., paper, \$1.50. Fundamental data on the important ore from which we obtain aluminum.

READINGS ON AGRICULTURAL MARKETING — Frederick V. Waugh, Ed.—Iowa State College Press, 456 p., illus., \$5.00. Varied material assembled for the use of administrators and research workers.

RETIREMENT AND THE INDUSTRIAL WORKER: Prospect and Reality — Jacob Tuckman and Irving Lorge — Teachers College, 105 p., \$2.75. Most adults must face two critical stress

points. First comes the change from youth to adult responsibilities, the second is the withdrawal from these cares. Here is a study by the Institute of Adult Education of how people meet the latter situation.

SUPPLEMENT TO MAJOR USES OF LAND IN THE UNITED STATES—U. S. Bureau of Agricultural Economics — Gov't Printing Office, 78 p., paper, 25 cents. Statistical tables to accompany USDA Technical Bulletin 1082.

TAXONOMIC TERMINOLOGY OF THE HIGHER PLANTS — H. L. Featherly — Iowa State College Press, 166 p., \$3.75. A convenient glossary for students.

TOTAL ECLIPSE OF THE SUN JUNE 30, 1954—U. S. Naval Observatory—Gov't Printing Office, 42 p., illus., paper, 40 cents. A supplement to the American Ephemeris, 1954.

TRANSPORTATION AND THE GROWTH OF CITIES — Harlan W. Gilmore—Free Press, 170 p., illus., \$3.00. The author believes that transportation systems are a better key to socio-economic systems than social scientists have recognized.

TRAVEL TO COMMERCIAL CENTERS — Gordon B. Sharpe and Kenneth C. Welch — Highway Research Board, Bulletin 79, 38 p., illus., paper, 60 cents. An aid to intelligent city planning.

TURRIALBA: Social Systems and the Introduction of Change—Charles P. Loomis and others, Eds. — Free Press, 288 p., illus., \$3.50. This study developed out of the need of technical cooperation personnel to understand the societies with which they work. Turrialba, Costa Rica, is the site of the Inter-American Institute of Agricultural Sciences.

20TH CENTURY MINUTEMEN: A Report to the President on a Reserve Forces Training Program — National Security Training Commission — Gov't Printing Office, 159 p., illus., paper, 50 cents. Scientists will be interested especially in the discussion of the unselective recall of reservists.

WHO'S WHO IN BRITISH SCIENCE 1953 — British Book Centre, 292 p., \$9.00. A welcome reference book.

ANNUAL REPORTS 1953—Free upon request direct to individual institutions.

THE AMERICAN MUSEUM OF NATURAL HISTORY, Central Park West at 79th St., New York 24, N. Y., 80 p., paper.

EDUCATIONAL TESTING SERVICE, 20 Nassau St., Princeton, N. J., 127 p., paper. Recommending that the routine teaching function and lecturing be turned over to training films and television.

JOHN AND MARY R. MARKLE FOUNDATION, 14 Wall Street, New York 5, N. Y., 76 p., paper. Reporting the disposition of some \$865,000 in grants.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge 39, Mass., 47 p., illus., paper. The aim is to conduct a professional school in the spirit of a university where "learning by doing" is stressed.

NOVA SCOTIA RESEARCH FOUNDATION, Halifax Canada, 61 p., illus., paper. To assist local industries to utilize the results of modern scientific research.

THE NUTRITION FOUNDATION, Inc., Chrysler Building, New York 17, N. Y., 74 p., illus., paper. In the present period much research has been directed toward learning about fat metabo-

lism and its relation to serious public health problems.

REINSELAER POLYTECHNIC INSTITUTE, Troy, N. Y., 38 p., paper. In the past year the academic administration was reorganized to qualify it to educate engineers and scientists able to make significant contributions to this modern age.

SLOAN-KETTERING INSTITUTE FOR CANCER RESEARCH, 410 East 68th St., New York 21, N. Y., 64 p., illus., paper. This institute, devoted exclusively to cancer research and teaching, is operated at a level of above \$2,800,000 a year.

TEXTILE RESEARCH INSTITUTE, Princeton, N. J., 67 p., illus., paper.

THE WORCESTER FOUNDATION FOR EXPERIMENTAL BIOLOGY, 222 Maple Ave., Shrewsbury, Mass., 44 p., illus., paper. Reporting outstanding progress in meeting the medical challenge of our times, particularly studies in hormones.

Science News Letter, January 23, 1954

NUTRITION

Japanese Synthetic Rice To Stretch Food Supply

▶ AN IMPROVED synthetic rice to help stretch Japan's food supply to meet the demands of an expanding population has been developed by Japanese scientists with wheat flour, potato starch and powdered rice.

Key to the development is taste. The Japanese consumer has high standards for rice and any synthetic must pass the taste test first, J. C. Dodson, agricultural attache of the American Embassy in Tokyo, has reported to the U. S. Department of Agriculture in Washington.

The new synthetic is a rice extender to be mixed with real rice in cooking and not to be eaten alone. Since the quantity of rationed low-cost rice is considered inadequate for most families, good extenders are eagerly sought.

The Japanese government is encouraging the development of the synthetic rice industry, which hopes to produce 1,000 tons a day by the end of this year.

Tests by government nutritionists show that a majority of the people will accept the product. One Tokyo department store is now selling about 50 two-pound bags a day, Mr. Dodson said.

Next to taste, price is the biggest hurdle for the synthetic rice industry. Government subsidies, particularly on potato starch, may help the industry lower prices to that of rationed rice. If this can be done lower income groups may use the synthetic extensively.

At the present time the government is losing \$65 a metric ton, which is 2,204.6 lbs., in subsidies on rationed rice, much of which is imported. What appeals to Japanese leaders is that wheat for the synthetic can be imported for \$90 a ton while imported rice costs about \$213 a metric ton.

Science News Letter, January 23, 1954

Accidents claimed about 94,000 lives in the U. S. during 1953; only cardiovascular diseases and cancer took a greater toll.

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ELECTRONICS

Heat Stable Transistor

► A MUCH sought after silicon transistor at last has been made in the laboratory. It should solve a pressing heat problem now plaguing designers of airborne military electronic gear.

Only a few ten-thousandths of an inch thick, the little wafer can do many jobs of conventional vacuum tubes in radio and television sets, hearing aids and electronic "brains."

Although the transistor in many ways is an answer to the dreams of electronic engineers, the silicon model will not go into commercial production until improvements can be made in the refinement of silicon, David B. Smith, Philco's vice-president of research, told the Washington chapter of the Institute of Radio Engineers.

Previous transistors largely have been made of germanium. This rare metal comes with a price tag of about \$500 a pound.

Found in common sand, silicon is one of the earth's most plentiful materials. It not only costs less than germanium, but also withstands rugged temperatures that "knock out" germanium's transistor qualities.

Using two jets of an indium salt, Philco engineers etched a thin wafer-like slab of silicon to microscopic thickness. At the desired point, the electric current passing through the silicon and liquid jets was reversed. This instantly electroplated the silicon with indium. Then electrodes were attached to the silicon wafer. (See SNL, Dec. 12, 1953, p. 373.)

The resulting silicon transistor kept its

desirable properties at high temperatures. It also worked well in the high-frequency radio band.

Transistors are becoming increasingly important in the field of electronics. This is particularly true of airborne gear such as radar and radio. Transistors, because of their tiny dimensions, permit the gear to be made lighter, and to be squeezed into smaller spaces on today's more complicated jet bombers and supersonic fighters.

However, transistors cannot do all the jobs of vacuum tubes. Consequently they often must be mixed with conventional tubes.

It is not practical to do this in airborne equipment today because heat given off by the tubes cannot escape easily. Highly sensitive to heat, germanium transistors are unreliable under such conditions. Engineers, however, believe the silicon transistor is the answer to this problem.

Science News Letter, January 23, 1954

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1-23-4

GENERAL SCIENCE

Science-Minded Youth

Urgent problem is to interest young people in all fields of science, since present shortage of technically trained persons is acute and will continue for many years.

► **HOW TO** get young people to become the scientists and engineers of the future is a problem that the world faces. The colleges are not turning out enough creative and technological brains to do all the jobs that industry and defense will demand in the future.

There is now an acute shortage of scientists and engineers. There will be an unfilled need in future years.

The starting point for these scientists and engineers of tomorrow is in the high schools. Many schools are not doing what they should in solid basic courses in science and mathematics, inspiringly taught. Many boys and girls do not learn of the opportunities before them. They do not realize what the world needs. Some can accomplish much more than the courses designed for the average will afford.

The youngster who does a science experiment or project as a hobby, outside the school room, is often the scientist of the future. Many of the great scientists of today got their start by making "ham" radio sets, collecting insects or minerals, tinkering with automobiles and engines, and doing a hundred other such things.

Today a third of a million boys and girls are in 15,000 science clubs in the nation's secondary schools. In over half a hundred areas they can enter their projects in science fairs, which means that about 40,000 to 50,000 such exhibits will be made and shown this spring. About a hundred winners of the local science fairs will compete in the Fifth National Science Fair to be held May 13-15 at Purdue University.

This great science club-fair movement, as well as the National Science Talent Search, is fostered nationally by SCIENCE SERVICE. All these youth activities are coordinated under Science Clubs of America, a SCIENCE SERVICE activity.

Many industries and professional sci-

tific and engineering societies are alert to the need of more young people entering training for science and technology. There is both an Engineering Manpower Commission and a Scientific Manpower Commission. These bodies, created by professional societies, will coordinate their programs for informing and inspiring high school students during 1954.

Creative youths in every part of the nation will thus have a chance to do the most that their ability allows. Parents, neighbors and teachers can now do something about the enthusiastic youths who get excited about remaking the world and discovering more about the universe. In every part of the nation, there are competent persons who will help.

(An inquiry to SCIENCE SERVICE in Washington will put the youth in touch with someone who is interested.)

Science News Letter, January 23, 1954

GENERAL SCIENCE

Future Science Manpower Hurt by Teacher Shortage

► **AMERICA'S FUTURE** scientific manpower is being hit hard by a growing shortage of high school science teachers.

In a 48-page report just published by Harvard University, 23 U. S. educators pointed out that the shortage will grow even more acute in the next decade.

Unqualified persons already are teaching science in some cases. In addition to giving poor instruction, these persons also may endanger their pupils by exposing them unwittingly to harmful chemicals, dangerous electrical devices and infectious bacterial agents, the educators warned.

The group foresaw the possibility that incompetent science teachers could present such a classroom "caricature of science" that promising students would develop a repugnance for the subject.

Overwork and low pay in the teaching profession were cited as the main reasons why college science graduates are turning to occupations other than teaching.

The educators recommended that colleges and universities undertake a vigorous campaign for recruiting secondary school teachers, especially in science and mathematics. High school teachers were asked to encourage their pupils to consider science teaching as a profession. The group also recommended that a five-year college training program for teachers be made a mandatory minimum.

Science News Letter, January 23, 1954

ORNITHOLOGY

NATURE RAMBLINGS



Winter Guests

► **WINTER BIRDS** do not have too hard a time of it in ordinary winter weather. Chickadees and nuthatches and their cheerful little kindred are used to cold weather—even seem to like it, for they do not fly on farther south as they easily might.

They make a pretty good living by prying insect pupae and egg masses out of crevices in the bark of trees, harvesting the seeds of weeds that stick up through the snow, and exploiting other sources of food that human beings would never think of.

Heavy snowfalls, especially if they are followed by light rain or partial thaw that puts a hard crust of glaze-ice on top, are apt to make life difficult on even the hardiest of "snowbirds."

There are many kinds of "snowbirds"—small birds that do not fear the snow and even like it. One of the less frequently seen of these is the snow bunting, which comes south from its real home on the wide, treeless tundras of the North only in the winter.

If you have taken up the admirable practice of caring for winter birds, by setting out offerings of food and by suppressing cats in your neighborhood, you may be blessed with a visit of these hardy little Northerners.

Unlike many of our birds, the snow buntings of both sexes look alike. Their winter plumage, in which we of course see them, is brown on top of the head, lighter on the neck, with white on the sides. The back is brown, streaked with black, the throat and underside of the body white, with a broad brownish band across the breast.

The brown upper parts blend with the white underside in a sort of brownish wash. The wings are sharply black and white, with some of the feathers brown-edged. The inner tail feathers are black, the outer white. All round, they are very well-dressed little birds.

Science News Letter, January 23, 1954

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BOTANY

Plant Migration Laboratory

Volcanic explosion of San Benedicto, which wiped out plant life on tiny island, gave scientists a rare opportunity to study the extinction and regrowth of plants.

► THE VOLCANIC explosion of a tiny island off the coast of Mexico last year has given University of California botanists a unique chance to study the extinction and regrowth of plants.

By the explosion, nature has set up a rare experiment and using it, the Berkeley scientists hope to learn more precisely how plants come to be where they are, and how land plants migrate to oceanic islands.

The nature-made laboratory is San Benedicto, a three-mile-long island off the tip of Lower California, whose eruption last year erased virtually every vestige of life. (See SNL, Jan. 10, 1953, p. 20, and SNL, Sept. 27, 1952, p. 195.)

Dr. Herbert Mason, director of the University's herbarium, made a detailed study of the island's vegetation in 1925, plotting all existing plants. There were 11 different plant species, including coarse grasses about five feet tall, sedges and other bushy plants covering almost every square foot.

Dr. Mason recently accompanied a group of zoologists, geologists and oceanographers from Scripps Institution of Oceanography on a visit to the island.

He found that less than 200 plants had survived the explosion, and that only five of the 11 original species were represented. There were only two living specimens of one of the grasses.

A total absence of plant life would have provided an excellent control for Dr. Mason's studies. However, among the remaining plants were those endemic to the island and found nowhere else in the world.

Knowing what plants formerly existed on the island and what plants remained after the explosion, Dr. Mason will be able to study the various natural means of re-vegetation.

"San Benedicto's fate is only the second such occurrence of that nature recorded," Dr. Mason pointed out. "Krakatoa in Sunda

Strait, which erupted in 1886 and killed all vegetation and thousands of people, was the first. But botanists did not get to the island for three years after the catastrophe."

The scientist said that seeds of new plants appearing on San Benedicto will probably be carried in the wind or by birds or will be washed in by the sea.

"If the shores of the island become vegetated first," he said, "we will surmise that the seeds were washed in by the sea. If the highest points on San Benedicto—the cliffs and hilltops—are the first to support plant life, we can guess that the seeds were probably borne on the wind."

Science News Letter, January 23, 1954

TECHNOLOGY

Turpentine By-Products

► A CHEMICAL by-product of gum turpentine that can be used in the manufacture of synthetic rubber and plastics may help get the ailing gum turpentine industry back on its feet.

Research on new uses for turpentine has centered at the U. S. Department of Agriculture Naval Stores Station, Olustee, Fla. Hit by competition from petroleum derivatives, new chemical industries and the depletion of pine timber, the gum turpentine in-

dustry has declined from an annual production of 760,000 barrels 25 years ago to less than half that amount today.

Latest product of research is the development of a method of producing pinane hydroperoxide from turpentine by Dr. G. S. Fisher. Organic peroxides are suitable for use in a number of industrial processes, especially in the production of synthetic rubber, resins and plastics.

Science News Letter, January 23, 1954

Questions

BACTERIOLOGY—Why are legume bacteria of value to farmers? p. 52.

□ □ □

BOTANY—Where are the B-vitamins in a grain of wheat concentrated? p. 53.

□ □ □

FORESTRY—How many species of trees are known in the U. S. and Alaska? p. 57.

□ □ □

METEOROLOGY—What new extraterrestrial source has been suggested as a rain-increasing agent? p. 53.

□ □ □

OPTICS—How do tinted windshields affect vision? p. 57.

□ □ □

RADIO ASTRONOMY—How have the inner parts of our Milky Way galaxy been spotted? p. 54.

□ □ □

Photographs: Cover, General Motors Corporation; pp. 51 and 53, Stanford University; p. 53, Radio Corporation of America; p. 64, Bakelite Company.

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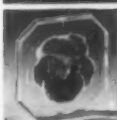
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❁ **TITANIUM LOCKNUTS** now are available in sizes ranging from 5/16 to 3/4 of an inch. They are designed to replace steel nuts in aircraft production where lightness and resistance to corrosion of chemicals, sea water and air are desirable.

Science News Letter, January 23, 1954

❁ **FRENCH-FRY ACCESSORY** for gas ranges permits the housewife to use the deep cooker to hold hot grease for frying potatoes, shrimp and doughnuts. The aluminum food-holding basket has a long handle and is easy to clean.

Science News Letter, January 23, 1954

❁ **GARBAGE-CAN SPRAY** kills nasty odors that attract insects and the mischievous noses of dogs. Sprayed on the garbage container from its own push-button can, the deodorizer also contains a detergent that cuts down the amount of food sticking to the can.

Science News Letter, January 23, 1954

❁ **HUNTING-FISHING JACKET**, made of a rugged plastic, protects the sportsman from year-around weather. The reversible jacket, shown in the photograph, is safety-red on one side and green on the other. Its seams are electronically welded. Its



parka hood keeps rain, snow and sleet from the user's head and neck, and its nine-inch plastic slide fastener at the throat permits easy donning and doffing of the garment.

Science News Letter, January 23, 1954

❁ **"NO-RATTLE" PAPER** for radio and television broadcasters and persons who are called upon for speech-making, actually is a chemical filter paper. It takes typing, pencil and the "ink" of ball-point pens.

Science News Letter, January 23, 1954

❁ **RADICAL STORAGE** battery, using nickel-cadmium cells in an alkaline solution, now is available commercially after four years of secret military production. The battery is invulnerable to shock and vibration, works in temperatures ranging from minus 65 degrees Fahrenheit to 165 degrees, and resists overcharging, reverse charging and short circuiting. It is said to outlast an automobile.

Science News Letter, January 23, 1954

❁ **INDUSTRIAL PLASTIC** trays, stronger than steel on a strength-weight basis, take freezing, heating- to baking-temperatures and rough handling. The trays, useful to bakeries and chemical and drug industries, are made from glass fiber impregnated with a polyester resin.

Science News Letter, January 23, 1954

❁ **NEW DUAL TV** set has a revolutionary feature which permits two programs to be flashed on its screen at once. Members of the audience wear polarized glasses which are "tuned" to one program or the other. Personalized ear pieces bring the proper sound to the viewer's ears. Particularly good in hospitals, and in homes where Junior demands a shoot-'em-up cowboy picture when parents switch on the news.

Science News Letter, January 23, 1954

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Do You Know?

At 20 degrees Fahrenheit, the energy available from an auto battery is only about 80% of what is available at 40 degrees.

Some hobbyists sculpture dried apples, coating the finished figures with shellac to preserve them.

The U. S. spent about \$85,000 a minute for national defense during 1953.

The albatross has the largest wingspread of any bird in proportion to body size; the record is 11 feet, four inches.

A colony of bees may contain 60,000 or more workers that visit 300,000 flowers a day.

From four to six times more hot water is needed in today's well-equipped home than was needed 20 years ago.